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10/573,507	08/28/2006	Olivier Lavastre	F-884 (31223.00114)	3556
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FINA TECHNOLOGY INC				
PO BOX 674412				
HOUSTON, TX 77267-4412				
EXAMINER				
LU, C CAIXIA				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/573,507

**Applicant(s)**

LAVASTRE ET AL.

**Examiner**

Caixia Lu

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/CD)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities.
  - (i) Page 3, lines 28-30, the polystyrene supported catalyst component is generically describe as "a porous functionalized bead of polystyrene and wherein the catalyst component is covalently bound to the support and is an iron based complex of general formula (I)". However, in the working example disclosed on page 12, the polystyrene supported catalyst blue beads is represented by structure 3 in lines 7-9 which does not have a covalent bound between the support 2 and the iron based complex 1. The cited working example is not consistent with the general description of the polystyrene supported catalyst.
  - (ii) Page 10, line 8, the disclosure of "which pressure??" is incomplete.  
Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 48 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The application as originally filed discloses a

hollow beads of polyethylene prepared by the steps of "providing a supported catalyst component wherein the support is a porous functionalized bead of polystyrene and wherein the catalyst component is covalently bound to the support and is an iron based complex of general formula (I)". First of all, the polystyrene support as originally filed is limited to "a porous functionalized bead of polystyrene" rather than "the porous polystyrene beads" of the instant claim which is not necessarily functionalized. The limitation of "porous polystyrene beads" is broader in scope as compared to the limitation of the porous functionalized beads of polystyrene and thus contains new matter. Secondly, in the polystyrene supported catalyst as originally filed requires the iron based complex to be covalently bond to the polystyrene beads, while the instant claim only calls for combining the polystyrene beads with the iron based complex, i.e., the chemical bonding between the polystyrene beads with the iron based complex is not necessary in the instant claim; therefore, the first combining step contains new matter. It is noted that the working example for the preparation of the styrene supported iron based complex 1 blue beads (3) disclose on page 12 in the specification does not require covalent bonding between the polystyrene beads 2 and the specific iron based complex 1. However, the specific iron based complex 1 does not provide full support for the generic iron based complex of formula (I) of the instant claim.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 48 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In line 9, the term "styrene" should be replaced with "polystyrene". Styrene is a liquid monomer.

***Claim Rejections - 35 USC § 103***

6. The following is a Res Judicata rejection in accordance with the decision of Board of Patent Appeals and Interferences of December 15 regarding the rejection of Claim 41 which has been cancelled in the Amendments filed in January 20, 2010. It is noted that the amended Claim 48 is substantially similar to cancel Claim 41 except that the step of combining of the porous polystyrene beads with the iron based complex of formula (I) is not included in Claim 41. However, it is understood that the contacting step is a necessary step to obtain the polystyrene supported iron based complex catalyst and such step is disclosed in Lin et al. (New J. Chem. 2002, 26, 1485-1489) as shown in the affirmed rejection under 35 U.S.C. 103 (a) of the Examiner's Answer filed November 7, 2008.

7. Claim 48 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Collina et al. (WO 96/11218) in view Chang (US 6,734,267), Smith et al. (US 4,587,227) and Lin et al. (New J. Chem. 2002, 26, 1485-1489).

Collina generally teaches a multistage process for preparation of olefin polymers to produce a wide range of olefin polymer compositions working with different catalyst systems in the various stages (page 4, lines 12-14). Collina expressly disclose a

multistage process comprising (A) a first stage of polymerization stage wherein one or more olefins are polymerized in the presence of titanium catalyst (Ziegler catalyst) to provide porous olefin polymer particles, (B) a treatment stage in which the catalyst used in the first stage of polymerization is deactivated and a second catalyst composition containing M- $\pi$  is impregnated to the porous polymer particles, and (C) a second stage of polymerization wherein one or more olefins are polymerized in the presence of the second catalyst impregnated on the porous olefin polymer particles from the first stage (page 4, line 12 to page 5, line 17). Since Collina's titanium catalyst is supported on  $MgCl_2$  (page 7, lines 1-3) and Collina's polyolefin particles from the first stage polymerization are prepared from sphere shaped titanium catalyst (page 7, lines 23-29), one would have expected the olefin polymer particles from the first stage to maintain the sphere shape of the catalyst particles.

It is noted that Collina does not expressly teach the impregnation of the catalyst to the porous polymer particles under reduced pressure and the preparation of the porous ethylene polymer beads in the presence of a polystyrene supported iron based complex of formula (I) of claim 38.

Impregnating the catalyst solution to a porous support under vacuum or pressure maximizes the impregnation of the catalyst composition to the porous of the support and thus minimizes fouling during polymerization and significantly enhances reactor operability. Such is taught in Chang (col. 1, line 55 to col. 2, line 7).

Lin expressly teaches a polystyrene supported iron based complex core-shell structure catalyst for providing polyethylene porous beads with improved morphology,

wherein the polystyrene supported catalyst is prepared by combining the polystyrene beads with iron based complex (Cat-1) (page 1485, Abstract; page 1486, Scheme 1; and page 1487, left col.).

It is routine practice to wash the supported catalyst to remove unsupported catalyst to minimize fouling during the polymerization and such is demonstrated in Smith (col. 8, lines 1-5).

The cited references are analogous because they all are from the same area of endeavor of olefin polymerizations.

Thus, it would have been obvious to a skilled artisan at the time the invention was made to employ Lin's polystyrene supported iron based complex core-shell structure catalyst in Collin's first stage polymerization of the multistage olefin polymerization process to provide a porous polyethylene beads with much improved morphology, and impregnating the polyethylene porous beads with a catalyst composition under reduced pressure and wash the supported catalyst to remove any unsupported catalyst complex in order to provide a support catalyst composition and further conducting an ethylene polymerization to provide a bimodal ethylene polymer with improved morphology and reduced fouling since such is conventionally done in the art and in the absence of any showing of criticality and unexpected results.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caixia Lu whose telephone number is (571) 272-1106. The examiner can normally be reached on 9:00 a.m. to 5:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (571) 272-1078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1796

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Caixia Lu/

Primary Examiner, Art Unit 1796